What is claimed is:

1. A carbon monoxide detector, comprising:

a housing forming a chamber therein, said housing including a first aperture;

a carbon monoxide sensor assembly having a second aperture positioned within said chamber;

a carbon monoxide gas generator assembly having a third aperture positioned within said chamber; and

a controller coupled to said carbon monoxide sensor assembly and to said carbon monoxide gas generator assembly, said controller commanding said carbon monoxide gas generator assembly to produce carbon monoxide, said controller further monitoring an electrical output of said carbon monoxide sensor assembly to ensure proper operation thereof.

2. The detector of claim 1, wherein said controller further monitors a voltage across said carbon monoxide gas generator assembly to ensure proper operation thereof.

3. The detector of claim 2, wherein said controller signals a failure of said detector when said voltage across said carbon monoxide gas generator exceeds a predetermined level.

4. The detector of claim 2, wherein said controller signals a failure of said detector when said voltage across said carbon monoxide gas generator is below a first predetermined level and a decay of said voltage at a time t_{tail} is above a second predetermined level.

5. The detector of claim 1, wherein said first aperture is diffusion limiting and said second and said third apertures are non-diffusion limiting.

6. The detector of claim 5, wherein each of said carbon monoxide sensor assembly and said carbon monoxide gas generator assembly include a water reservoir.

7. The detector of claim 5, wherein one of said carbon monoxide sensor assembly and said carbon monoxide gas generator assembly includes a water reservoir.

8. The detector of claim 5, wherein both said carbon monoxide sensor assembly and said carbon monoxide gas generator assembly share a single water reservoir.

9. The detector of claim 1, wherein said first aperture is non-diffusion limiting and said second and said third apertures are diffusion limiting.

10. The detector of claim 9, wherein each of said carbon monoxide sensor assembly and said carbon monoxide gas generator assembly include a water reservoir.

11. The detector of claim 9, wherein both said carbon monoxide sensor assembly and said carbon monoxide gas generator assembly share a single water reservoir.

12. The detector of claim 1, wherein said first, said second, and said third apertures are in gaseous communication through said chamber.

13. The detector of claim 1, wherein said controller monitors said electrical output of said carbon monoxide sensor assembly prior to commanding said carbon monoxide gas generator assembly to produce carbon monoxide.

14. The detector of claim 13, wherein said controller inhibits said commanding of said carbon monoxide gas generator assembly to produce carbon monoxide when said electrical output of said carbon monoxide sensor assembly is greater than a predetermined level.

15. The detector of claim 13, wherein said controller monitors said electrical output of said carbon monoxide sensor assembly at a time t_{peak} and during a period of signal decay, said controller further integrating said electrical output of said carbon monoxide sensor assembly from a time t_{start} to a time t_{stop}, averaging over said time t_{start} to a time t_{stop}, and subtracting said electrical output of said carbon monoxide sensor assembly monitored prior to commanding said carbon monoxide gas generator assembly to produce carbon monoxide to derive a measure of said carbon monoxide sensor assembly response.

16. The detector of claim 15, wherein said controller utilizes said measure of said carbon monoxide sensor assembly response to correct a calibration of said carbon monoxide sensor assembly.

17. The detector of claim 1, further comprising means for compensating for ambient temperature variations.

18. The detector of claim 17, wherein said means comprises ambient temperature sensing circuitry in communication with said controller.

19. The detector of claim 18, further comprising a programmed current source/sink controllably in communication with said controller and operatively in communication with said carbon monoxide gas generator assembly, said programmed current source/sink generating a current pulse having a magnitude and a duration, said current pulse being delivered to said carbon monoxide gas generator assembly under command of said controller to cause said carbon monoxide gas generator assembly to produce carbon monoxide, said controller commanding an adjustment in said magnitude of said current pulse as a function of said ambient temperature to produce a constant amount of carbon monoxide.

20. The detector of claim 18, further comprising a programmed current source/sink controllably in communication with said controller and operatively in communication with said carbon monoxide gas generator assembly, said programmed current source/sink generating a current pulse having a magnitude and a duration, said current pulse being delivered to said carbon monoxide gas generator assembly under command of said controller to cause said carbon monoxide gas generator assembly to produce carbon monoxide, said controller commanding an adjustment in said duration of said current pulse as a function of said ambient temperature to produce a constant amount of carbon monoxide.

21. The detector of claim 18, wherein said controller compensates said electrical output of said carbon monoxide sensor assembly as a function of said ambient temperature to account for a variation in an amount of carbon monoxide gas produced by said carbon monoxide gas generator assembly as a function of said ambient temperature.

22. The detector of claim 18, wherein said controller ensures that said ambient temperature is within a predetermined range prior to commanding said carbon monoxide gas generator to produce carbon monoxide.

23. The detector of claim 17, wherein said means comprise a temperature sensitive load resistor network coupled to said carbon monoxide sensor assembly to automatically compensate said electrical output of said carbon monoxide sensor assembly as a function of ambient temperature.

24. The detector of claim 17, wherein said means comprise a temperature sensitive amplifier coupled to said carbon monoxide sensor assembly to automatically

compensate said electrical output of said carbon monoxide sensor assembly as a function of ambient temperature.

25. The detector of claim 1, wherein said carbon monoxide sensor assembly comprises:

a can forming a water reservoir therein;

a bottom disk positioned within said can to separate said water reservoir from an upper sensor portion of said can, said bottom disk including at least one aperture therein;

a hydrophobic layer positioned on said bottom disk covering said at least one aperture;

an electrode assembly positioned on said hydrophobic layer;

a first washer positioned on said electrode assembly, said first washer having an outer periphery that is closely accommodated by an inner surface of said can, said first washer further defining a hole therein having a diameter that is smaller than a diameter of said electrode assembly;

a diffusion layer positioned on said first washer;

a second washer positioned on said diffusion layer, said second washer having an outer periphery that is closely accommodated by said inner surface of said can, said second washer further defining a hole therein having a diameter that is smaller than a diameter of said diffusion layer;

a gasket positioned on said second washer; and

a top disk in sealing engagement with said gasket, said top disk defining an aperture therein; and

wherein said can is crimped to seal said carbon monoxide sensor assembly, said diffusion layer being deformed therein to provide electrical contact between said top disk and a top of said electrode assembly, electrical contact between a bottom of said electrode assembly and said can being provided by said hydrophobic layer and said bottom disk.

26. The detector of claim 25, wherein said diffusion layer and said hydrophobic layer comprises a microporous carbon loaded PTFE compound.

27. The detector of claim 25, wherein said electrode assembly comprises an ion exchange membrane having an upper and a lower surface thereof coated with an electrode.

28. The detector of claim 1, wherein said carbon monoxide gas generator assembly comprises:

a can forming a water reservoir therein;

a bottom disk positioned within said can to separate said water reservoir from an upper sensor portion of said can, said bottom disk including at least one aperture therein;

a hydrophobic layer positioned on said bottom disk covering said at least one aperture;

an electrode assembly positioned on said hydrophobic layer, said electrode assembly comprising an ion exchange membrane having electrodes deposited on an upper and on a lower surface thereof, said electrodes containing a mixture of carbon black and ion exchange polymer and no platinum;

a diffusion layer;

a gasket; and

a top disk in sealing engagement with said gasket, said top disk defining an aperture therein; and

wherein said can is crimped to seal said carbon monoxide gas generator assembly, said diffusion layer providing electrical contact between said top disk and a top of said electrode assembly, electrical contact between a bottom of said electrode assembly and said can being provided by said hydrophobic layer and said bottom disk.

29. The detector of claim 28, further comprising a first washer positioned on said electrode assembly, said first washer having an outer periphery that is closely accommodated by an inner surface of said can, said first washer further defining a hole therein having a diameter that is smaller than a diameter of said electrode assembly.

30. The detector of claim 29, further comprising a second washer positioned on said diffusion layer, said second washer having an outer periphery that is closely accommodated by said inner surface of said can, said second washer further defining a hole therein having a diameter that is smaller than a diameter of said diffusion layer.

31. The detector of claim 1, wherein said carbon monoxide gas generator assembly comprises:

a can forming a water reservoir therein;

a bottom disk positioned within said can to separate said water reservoir from an upper sensor portion of said can, said bottom disk including at least one aperture therein;

a hydrophobic layer positioned on said bottom disk covering said at least one aperture containing no platinum;

an electrode assembly positioned on said hydrophobic layer, said electrode assembly comprising an ion exchange membrane;

a diffusion layer containing no platinum positioned to contact said electrode assembly;

a gasket; and

a top disk in sealing engagement with said gasket, said top disk defining an aperture therein; and

wherein said can is crimped to seal said carbon monoxide gas generator assembly, said diffusion layer providing electrical contact between said top disk and a top of said electrode assembly, electrical contact between a bottom of said electrode assembly and said can being provided by said hydrophobic layer and said bottom disk.

32. The detector of claim 30, further comprising a first washer positioned on said electrode assembly, said first washer having an outer periphery that is closely accommodated by an inner surface of said can, said first washer further defining a hole therein having a diameter that is smaller than a diameter of said electrode assembly.

33. The detector of claim 32, further comprising a second washer positioned on said diffusion layer, said second washer having an outer periphery that is closely accommodated by said inner surface of said can, said second washer further defining a hole therein having a diameter that is smaller than a diameter of said diffusion layer.

34. A carbon monoxide sensor assembly, comprising:

a can forming a water reservoir therein;

a bottom disk positioned within said can to separate said water reservoir from an upper sensor portion of said can, said bottom disk including at least one aperture therein;

a hydrophobic layer positioned on said bottom disk covering said at least one aperture;

an electrode assembly positioned on said hydrophobic layer;

a first washer positioned on said electrode assembly, said first washer having an outer periphery that is closely accommodated by an inner surface of said can, said first washer further defining a hole therein having a diameter that is smaller than a diameter of said electrode assembly;

a diffusion layer positioned on said first washer;

a second washer positioned on said diffusion layer, said second washer having an outer periphery that is closely accommodated by said inner surface of said can, said second washer further defining a hole therein having a diameter that is smaller than a diameter of said diffusion layer;

a gasket positioned on said second washer; and

a top disk in sealing engagement with said gasket, said top disk defining an aperture therein; and

wherein said can is crimped to seal said carbon monoxide sensor assembly, said diffusion layer being deformed therein to provide electrical contact between said top disk and a top of said electrode assembly, electrical contact between a bottom of said electrode assembly and said can being provided by said hydrophobic layer and said bottom disk.

35. The assembly of claim 34, wherein said diffusion layer and said hydrophobic layer comprises a microporous carbon loaded PTFE compound.

36. The assembly of claim 34, wherein said electrode assembly comprises an ion exchange membrane having an upper and a lower surface thereof coated with an electrode.

37. A carbon monoxide gas generator assembly, comprising:

a can forming a water reservoir therein;

a bottom disk positioned within said can to separate said water reservoir from an upper generator portion of said can, said bottom disk including at least one aperture therein;

a hydrophobic layer positioned on said bottom disk covering said at least one aperture;

an electrode assembly positioned on said hydrophobic layer, said electrode assembly comprising an ion exchange membrane having electrodes deposited on an upper and on a lower surface thereof, said electrodes containing a mixture of carbon black and ion exchange polymer and no platinum;

a diffusion layer;

a gasket; and

a top disk in sealing engagement with said gasket, said top disk defining an aperture therein; and

wherein said can is crimped to seal said carbon monoxide gas generator assembly, said diffusion layer providing electrical contact between said top disk and a top of said electrode assembly, electrical contact between a bottom of said electrode assembly and said can being provided by said hydrophobic layer and said bottom disk.

38. The assembly of claim 37, further comprising a first washer positioned on said electrode assembly, said first washer having an outer periphery that is closely accommodated by an inner surface of said can, said first washer further defining a hole therein having a diameter that is smaller than a diameter of said electrode assembly.

39. The assembly of claim 38, further comprising a second washer positioned on said diffusion layer, said second washer having an outer periphery that is closely accommodated by said inner surface of said can, said second washer further defining a hole therein having a diameter that is smaller than a diameter of said diffusion layer.

40. A carbon monoxide gas generator assembly, comprising:

a can forming a water reservoir therein;

a bottom disk positioned within said can to separate said water reservoir from an upper generator portion of said can, said bottom disk including at least one aperture therein;

a hydrophobic layer positioned on said bottom disk covering said at least one aperture containing no platinum;

an electrode assembly positioned on said hydrophobic layer, said electrode assembly comprising an ion exchange membrane;

a diffusion layer containing no platinum positioned to contact said electrode assembly;

a gasket; and

a top disk in sealing engagement with said gasket, said top disk defining an aperture therein; and

wherein said can is crimped to seal said carbon monoxide gas generator assembly, said diffusion layer providing electrical contact between said top disk and a top of said electrode assembly, electrical contact between a bottom of said electrode assembly and said can being provided by said hydrophobic layer and said bottom disk.

41. The assembly of claim 40, further comprising a first washer positioned on said electrode assembly, said first washer having an outer periphery that is closely accommodated by an inner surface of said can, said first washer further defining a hole therein having a diameter that is smaller than a diameter of said electrode assembly.

42. The assembly of claim 41, further comprising a second washer positioned on said diffusion layer, said second washer having an outer periphery that is closely accommodated by said inner surface of said can, said second washer further defining a hole therein having a diameter that is smaller than a diameter of said diffusion layer.

43. A method of calibrating a carbon monoxide detector having a carbon monoxide sensor and a carbon monoxide gas generator in gaseous communication, comprising the steps of:

controlling the carbon monoxide gas generator to generate a known quantity of carbon monoxide;

monitoring a response of the carbon monoxide sensor to the known quantity of carbon monoxide; and

correcting a calibration of the carbon monoxide sensor when the response is outside of a predetermined range.

44. The method of claim 43, wherein the step of controlling the carbon monoxide gas generator to generate a known quantity of carbon monoxide comprises the step of providing a current pulse to the carbon monoxide gas generator, the current pulse having a duration and a magnitude.

45. The method of claim 44, further comprising the steps of measuring an ambient temperature, and compensating the step of controlling the carbon monoxide gas generator to generate a known quantity of carbon monoxide as a function of the ambient temperature.

46. The method of claim 45, wherein the step of compensating comprises the step of adjusting the duration of the current pulse as a function of the ambient temperature.

47. The method of claim 45, wherein the step of compensating comprises the step of adjusting the magnitude of the current pulse as a function of the ambient temperature.

48. The method of claim 43, further comprising the steps of measuring an ambient temperature, and adjusting the response of the carbon monoxide sensor as a function of the ambient temperature to compensate for a temperature effect on the carbon monoxide gas generator.

49. The method of claim 43, further comprising the steps of measuring an ambient temperature prior to the steps of controlling, monitoring, and correcting, and prohibiting the steps of controlling, monitoring, and correcting when the ambient temperature is outside a predetermined range of temperatures.

50. The method of claim 43, further comprising the step of compensating the response of the carbon monoxide sensor as a function of ambient temperature.

51. The method of claim 43, further comprising the steps of monitoring an output of the carbon monoxide sensor prior to the step of controlling the carbon monoxide gas generator to generate a known quantity of carbon monoxide, and prohibiting the steps of controlling, monitoring, and correcting when the output exceeds a predetermined threshold.

52. The method of claim 43, further comprising the steps of monitoring an output of the carbon monoxide sensor prior to the step of controlling the carbon monoxide gas generator to generate a known quantity of carbon monoxide, and subtracting the output of the carbon monoxide sensor monitored before the step of controlling from the response of the carbon monoxide sensor monitored after the step of controlling.

53. The method of claim 43, further comprising the steps of monitoring the carbon monoxide gas generator to ensure proper operation thereof, and indicating a fault when the step of monitoring indicates that the carbon monoxide gas generator is not operating properly.

54. The method of claim 53, wherein the step of monitoring the carbon monoxide gas generator comprises the step of monitoring a voltage across the carbon monoxide gas generator during the step of controlling the carbon monoxide gas generator, and indicating that the carbon monoxide gas generator is not operating properly when the voltage across the carbon monoxide gas generator exceeds a predetermined acceptable voltage range.

55. The method of claim 53, wherein the step of monitoring the carbon monoxide gas generator comprises the step of monitoring a voltage across the carbon monoxide gas generator after the step of controlling the carbon monoxide gas generator during a period of decay, and indicating that the carbon monoxide gas generator is not operating properly when the voltage across the carbon monoxide gas generator exceeds a predetermined voltage level.